CLAIMS

What is claimed is:

1. A fluidics system, comprising;

a primary fluid channel comprising an input and an output;

an enclosed first reservoir connected to said primary fluid channel input and comprising a first adjustable vent;

an enclosed second reservoir connected to said primary fluid channel input and comprising a second adjustable vent;

a negative pressure connected to said primary fluid channel output;

wherein the fluidics system is configured to selectively draw at least one fluid from at least one of the first and second reservoirs into the primary fluid channel when the negative pressure source is activated and the respective reservoir is unsealed.

2. The fluidics system of claim 1, further comprising:

an analytical device associated with said primary fluid channel.

3. The fluidics system of claim 1, wherein said primary fluid channel is at least 10% larger in cross section than any particle in said first and second fluids.

4. The fluidics system of claim 1, further comprising:

more than one secondary fluid channels configured parallel and/or serial to each other.

5. The fluidics system of claim 4, further comprising:

more than one negative pressure sources downstream of said secondary fluid channels.

6. The fluidics system of claim 4, further comprising:

a manifold connecting said secondary fluid channels to said negative pressure source.

7. The fluidics system of claim 1, wherein said first reservoir comprises more than one chamber.

8. The fluidics system of claim 1, further comprising:

a valve associated with said first vent; and

a valve associated with said second vent.

9. The fluidics system of claim 1 further comprising:

an auxiliary fluid reservoir and a connection valve,

wherein the auxiliary fluid reservoir is connected through the connection valve to an auxiliary input of at least one the first and second reservoirs; and the system is configured to selectively draw fluid from the auxiliary fluid reservoir into at least one of the first and second reservoirs when the negative pressure source is activated, the connection valve is open, and the

respective reservoir is not vented to a pressure source having a pressure less than a pressure of the negative pressure source.

10. The fluidics system of claim 1, further comprising:

a second primary fluid channel; and

a second manifold connecting said primary fluid channels to said negative pressure source down stream of said primary fluid channels.

11. The fluidics system of claim 1, further comprising:

a waveguide for surface-sensitive optical detection of an analyte in said first or second fluid.

12. The fluidics system of claim 11, further comprising:

a waveguide sensing system;

wherein said waveguide sensing system comprises:

a plurality of waveguides;

wherein each of said waveguides has a first surface, a second surface opposing said first surface, and an end surface essentially perpendicular to said first and second surfaces, and

wherein said first surface of each of said waveguides has a analyte recognition element thereon;

a waveguide holder to which each of said waveguides is secured; and

an optical detector positioned opposite said end surface of at least one of said waveguides.

13. The fluidics system of claim 1, wherein said first and second vents are adjustable so that first and second fluids from said first and second reservoirs, respectively, move at a first and a second flow rate to said primary fluid channel; and

wherein a difference between said first and second flow rates is proportional to a difference in adjustments of said first and second vents.

14. The fluidics system of claim 1, wherein first or second fluid moves from said first or second reservoir, respectively, at a first and second flow rate,

wherein a difference between said first and second flow rates is proportional to a differential fluid flow resistance, and

wherein said differential fluid flow resistance is adjusted by said first and second fluid vents.

15. The fluidics system of claim 1, wherein said primary fluid channel has a cross section greater than 1 micron.

16. The fluidics system of claim 1, wherein said system is a portable analysis system configured to perform at least one of a biological and chemical analysis.

17. A portable analysis system for conduction of biochemical and/or chemical analysis, comprising:

a three-dimensional fluid circuit;

a first enclosed reservoir having a first adjustable vent;

a second enclosed reservoir having a second adjustable vent;

a first passageway for receiving a first fluid from said first reservoir;

a second passageway for receiving a second fluid from said second reservoir;

a primary fluid channel;

a first connecting channel connecting said first passageway to said primary channel;

a second connecting channel connecting said second passageway to said primary channel;

a multimode waveguide;

a barrier configured to prevent fluid flow between said first and second connecting channels; and

a negative pressure source downstream of said primary fluid channel;

wherein said first and second reservoirs and passageways are elements in said fluid circuit;

wherein said fluid circuit comprising elements and a series of layers and at least one of said elements is formed using molding techniques and at least partial elements are formed by molding and mechanical, chemical, thermal or optical etching,

wherein each layer of a series of layers is at least a partial element of said fluid circuit,

wherein said layers are fused together to form complete elements of said fluid circuit, and

wherein said negative pressure source being configured for moving said first fluid but not said second fluid to said primary fluid channel when said first adjustable vent is not in a closed position and said second adjustable vent is in a closed position; for moving said second fluid but not said first fluid to said primary fluid channel when said second adjustable vent is not closed and said first adjustable vent is closed; and for moving said first and second fluids to said primary fluid channel when said first and second adjustable vents are not closed.

18. The fluidics system of claim 17, wherein said fluidics system is configured to conduct analysis of at least one of said first and second fluid.

19. The fluidics system of claim 18, wherein said first and second fluids are analyzed in said primary fluid channel.

20. The fluidics system of claim 17, wherein said first fluid is a sample and said second fluid is a reagent.

21. A method of controlling fluid flow, comprising the steps of:

moving a first fluid in a first reservoir having an adjustable first vent to a primary fluid channel when said first adjustable vent is not in a closed position and not moving a second fluid in

a second reservoir having a second adjustable vent in a closed position when a negative pressure source is activated downstream of said primary fluid channel.

22. A method of performing a biochemical analysis, comprising the steps of:

moving a first fluid in a first reservoir having an adjustable first vent to a primary fluid channel when said first adjustable vent is not in a closed position and not moving a second fluid in a second reservoir having a second adjustable vent in a closed position when a negative pressure source is activated downstream of said primary fluid channel; and

analyzing a first fluid.

23. The method of claim 22, wherein said analyzing step is performed in said primary fluid channel, and wherein in said primary channel an internal surface is configured to at least one of capture, recognize, respond to, and detect an analyte.

24. The method of claim 23, wherein said primary fluid channel comprises a waveguide,

wherein said waveguide is adapted for transmitting optical signals to a detector, and

wherein said optical signal indicates presence or absence of an analyte.

25. The method of claim 24, wherein said waveguide comprises a multimode waveguide having a surface bearing patterned, reflective coating,

wherein said coating defines a reflectively coated region and a first optically exposed region on said surface,

wherein said first optically exposed region is configured to produce an alteration indicative of the presence of a first analyte,

wherein said alteration is detectable by launching a light wave into said waveguide to generate an evanescent field at said patterned surface, and then detecting an interaction of said first optically exposed region with said evanescent wave.

26. A method of controlling fluid flow, comprising:

selectively drawing at least one fluid from at least one of a first and a second reservoir into a primary fluid channel, the selectively drawing comprising activating a negative pressure source and unsealing one of the reservoirs, wherein

the primary fluid channel comprises an input and an output;

the first reservoir comprises a first fluid output fluidically connected to the primary fluid channel input, and a first vent configured to selectively seal and unseal said first reservoir;

the second reservoir comprises a second fluid output fluidically connected to the primary fluid channel input, and a second vent configured to selectively seal and unseal said second reservoir; and

the negative pressure source is connected to the primary fluid channel output.

27. The system of Claim 1, wherein the system is configured such that fluid does not flow from said reservoirs into said primary fluid channel unless both said negative pressure source is activated and said at least one reservoir is unsealed.

28. The system of Claim 1, wherein the system further comprises a system relief vent connected to said primary flow channel, said system relief vent being configured to seal and unseal said primary flow channel from contact with an external atmosphere.